

Running head: REDUCING RESIDENTIAL RENTAL UNIT FIRES

## Reducing Residential Rental Unit Fires in Cedar Falls Iowa

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Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed:

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John-Paul Schilling

### Abstract

This applied research project comes from a problem that was discovered in Cedar Falls, Iowa where 58 percent of all fires occur in residential rental units. Through descriptive research the following four questions were answered: What are the factors causing fires in residential rental units? What are other university communities doing to address fires in residential rental properties? What educational and informational components can be implemented to reduce the problem of fires in residential rental properties? What legislative solutions can be enacted to reduce the fire problem in rental units?

The procedures utilized a literature review of published articles via the internet, a statistical analysis of Cedar Falls Fire Rescue's records management system and a questionnaire designed to elicit information from other university communities that determined their level of awareness and reaction to the problem. This questionnaire was sent to seventy-five communities in the United States that have responsibilities of protecting on and off-campus housing.

The research results showed that Cedar Falls statistics were similar to those of other comparable cities in the nation. While other communities share the same problem, the majority have not yet developed a risk-reduction program. Educational components need to be developed to heighten the awareness of residential rental unit's tenants. Finally, many steps have begun that bring recognition of the problem to local, regional and national legislative bodies.

The results of this research project have lead to the recommendation that a comprehensive community risk reduction program needs to be developed through a coalition of community partners addressing the issue of fires in residential rental units.

## Table of Contents

Certification Statement.....	page 2
Abstract.....	page 3
Table of Contents.....	page 4
Introduction.....	page 5
Background and Significance.....	page 5
Literature Review.....	page 9
Procedures.....	page 16
Limitations.....	page 19
Definitions.....	page 19
Results.....	page 20
Discussion.....	page 26
Recommendations.....	page 28
References.....	page 32

### List of Tables:

Table 1: Leading Causal Factors Fires in Residential Structures.....	page 22
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### List of Appendix

Appendix A.....	page 35
Appendix B.....	page 38
Appendix C.....	page 39

## Introduction

While over 58% of all structure fires in Cedar Falls, Iowa, occur in residential rental units, residential rental units are only 34% of the residential building stock within the corporate limits of Cedar Falls. Cedar Falls Fire Rescue should expand its community risk-reduction program to address the significantly higher number of fires in rental properties. The purpose of this research is to determine solutions to, reduce the number of fires in residential rental units.

Through the use of descriptive research, this project will answer the following research questions: What are the factors causing fires in residential rental units? What are other university communities doing to address fires in residential rental properties? What educational and informational components can be implemented to reduce the problem of fires in residential rental properties? What legislative solutions can be enacted to reduce the fire problem in rental units?

The results and recommendations of this research will allow the administration of Cedar Falls Fire Rescue to improve their community risk-reduction program.

## Background and Significance

The City of Cedar Falls is located in the heart of the Cedar Valley in Northeast Iowa. Cedar Falls is a growing community of over 36,000 full-time residents and a population of some 13,000 students from the University of Northern Iowa both of which have provided stability and growth for the City. The City offers a full range of services and has a current annual operating budget of \$21,503,840. (City of Cedar Falls [CCF], 2010)

Incorporated in 1854, the City of Cedar Falls quickly grew into a thriving community. (City of Cedar Falls, 2010)

In 1863, what is now known as the University of Northern Iowa (UNI) began with the Civil War Soldier's Orphan Home, which was later renamed to Old Central. Ultimately, the facility changed its focus and it was renamed several times to the Iowa State Normal School in 1876, the Iowa State Teacher's College in 1909, and in 1961 the State College of Iowa. Finally in July of 1967, the State College of Iowa became known as the University of Northern Iowa. (City of Cedar Falls, 2010, p. 1)

In 1860 Cedar Falls Fire Rescue was organized with one hundred men and two hose carts. One hose carts was stationed on Normal Hill (now College Hill) and one in the downtown area in an effort to better serve the growing needs of the community. In 1918 Jim Peterson was hired as the first paid firefighter and the first paid fire chief. Also, in the same year, the City bought its first motorized fire apparatus to maintain public safety along with the growth of the Iowa State Teachers College. (Cedar Falls Fire Rescue, 2009) Through many changes in personnel levels since 1860, Cedar Falls Fire Rescue now employs 33 full-time equivalent (FTE) firefighters, 5 cross trained city employees and 3 volunteer firefighters. Cedar Falls Fire Rescue anticipates the hiring of an additional 16 volunteer firefighters by the end of calendar year 2010.

Since 2005 Cedar Falls Fire Rescue (CFFR) has become active in community risk reduction by establishing partnerships with the Cedar Falls Public School District and the University of Northern Iowa. Working with the public school district, CFFR introduced the Igniter Program in 2005. The Igniter Program was developed from the consumer science class of eighth grade students. During the spring semester these eighth grade students are required to complete a job application and go through a job interview. CFFR took this program one step further for students who apply to the fire department after interviews six students are selected to serve as community partners in public fire education. These six students go through a mini fire

academy and learn the job of a firefighter. CFFR emphasizes the importance of public fire education during the academy. At the end of the academy the six students become official fire department partners. During the fall semester of their 9<sup>th</sup> grade year, the six Igniters also assist the Cedar Falls firefighters in delivering the fire-safety education message to children in elementary schools. (J. Bostwick, personal communication, August 10, 2010)

In 2006 Cedar Falls Fire Rescue entered into a partnership with the University of Northern Iowa Safety and Student Services Department with a joint purchase of a Draeger Fire Safety Systems, Fire Extinguisher Trainer and Trailer. This equipment is operated by CFFR and provides a venue for teaching fire extinguisher use to UNI faculty and resident assistants. While CFFR staff has a captive audience for the fire extinguisher training, many important fire safety and prevention lessons are also presented. The safety training equipment is also used throughout the community to instruct employees of businesses, members of service clubs and many non-profit organizations. Since its inception, the program has touched over two thousand fire safety class participants. (Cedar Falls Fire Rescue, 2009)

The University of Northern Iowa has also expanded the responsibilities of their Campus Fire Safety Specialist in an effort to improve and maintain minimum fire safety standards throughout campus facilities. The position is also responsible for the asbestos and lead paint abatement program. In an on-going effort to continue to reduce risk in the community, CFFR staff has played an active role in assisting the Campus Fire Safety Specialist in meeting UNI's mission, objectives and goals. (D. Shoars, personal communication, August 11, 2010)

The background of this applied research project comes from an observation within just a few short months after the author of this project became the chief of Cedar Fall Fire Rescue. It was quite noticeable that during the early months of 2009, 100% of the residential structure fires

within the corporate limits of Cedar Falls were all in rental housing units. All but one of these fires occurred in off campus residential rental units. It will be the focus of this applied research project to concentrate on the student populations. Students who live on campus account for 28% of Cedar Falls renting population. The remaining 72% of students live off campus.

Cedar Falls Fire Rescue does not have a formal risk reduction program to address the alarming number of fires in residential rental units. The only exposure CFFR has had with the University components of this problem is the fire extinguisher training to resident assistants, faculty, and staff. Another missing component is access to those students transitioning to off campus housing and the tenants of rental properties who do not have any relationship to UNI.

Through the academic school years 2000-2009 there have been 140 fire fatalities documented in the United States. Over 80% of the fatalities occurred in off campus housing nationally. (Comeau, n.d.) In the searchable data base maintained by CFFR, there has not been a documented fire fatality in a residential rental unit. With 80 percent of the available residential rental units occupied by University of Northern Iowa students and 58 percent of the fires in Cedar Falls are occurring in these units, the law of averages could soon catch up to Cedar Falls with disastrous consequences.

This applied research project addresses the course content found in the National Fire Academy course: Executive Analysis of Community Risk Reduction. Specifically it complements Unit 1: The Executive Fire Officer as a Community Risk-Reduction Strategist by analyzing the potential impact of unaddressed community risks and identifying components of effective risk reduction. (United States Department of Homeland Security, 2009, p. SM 1-1) as well as Unit 2: Assessing Community Risk by assessing the causal factors in their community. (United States Department of Homeland Security, 2009, p. SM 2-1).

With the recognition of the high rate of fires in residential rental units in Cedar Falls, Iowa, the research conducted and subsequent recommendations should reduce the frequency of fires in this class of structures: Building a comprehensive program to address the prevention and educational components is necessary to be successful. This applied research project will support one of two of the four the United States Fire Administrations Operational Objectives: The first reducing risk at the local level through prevention and mitigation and the second being to improving local planning and objectives. (United States Fire Administration, 2009, p. II-2)

### Literature Review

During a period when structural fires have been declining nation wide – down 40% over the past 20 years to about 1.8 million fires each year. Fires in college residence hall dormitories, and sororities and fraternities houses remain stubbornly steady between 1,500 and 1,800 each year. Although most fires in college residences are small, each has the potential for tragedy. (Carter and Burgess, 2006, p. 7)

In October of 2004 the Federal Emergency Management Agency (FEMA) and the United States Fire Administration (USFA) published a report titled A Profile of Fire in the United States 1992-2001. Within this report statistics over the surveyed period show that 73% of fires in the United States occurred in residential structures. (United States Fire Administration, [USFA] 2004)

The most recent edition A Profile of Fire in the United States 2003-2007, published by the United States Fire Administration again revealed that residential structure fires still outnumber other structures by three to one. (United States Fire Administration, 2010, p. 4) Within

these two reports, it is noted that only one reference was made in the 2004 edition that makes reference to rental property. This reference is vague and only stating:

Apartments tend to be more regulated by building codes than one- and two-family dwellings. Most are rental properties, often falling under stringent fire prevention statutes. Because apartment buildings usually have large clusters of similar people, prevention programs can be tailored to the cause and profiles of apartment buildings in different areas of the community. (USFA, 2004, p. 16)

With only 23% of fires residential structure fires reported as apartment type structures, this leaves out a large population of residential structures such as 1 & 2 family dwellings, boarding houses, barracks, dormitories and sorority/fraternity houses to be researched and reviewed to produce conclusive results. Therefore, this author has taken the approach in this literature review for research question 1: (What are the factors causing fires in residential rental units?) to be reviewed as causes of fires in residential structures.

While the number of college fires remains high, the technology exists to reduce the risks to life and property resulting from dormitory fires. Proven fire protection strategies that have been shown to be effective have not received the funding or the attention needed for proper implementation. Fire in college residences is a preventable tragedy. (Carter and Burgess, 2006, p. 7)

Cooking has been the leading cause of fires in most years except in the 1970's when heating became the leading cause with a surge in the use of space heaters and wood heating. (United States Fire Administration, 1997, p. 20) Cooking equipment, most often a range or stove top, is the leading cause of reported home fires and home fire injuries in the United States.

Cooking equipment is also the leading cause of unreported fires. More cooking equipment fires are caused by human error than malfunction. (Nicholson, 2006, p. 1)

The second leading cause of fires in residential structures is heating equipment. Heating equipment fires accounted for 16 percent of all reported home fires in 2005 (second only to cooking fires). (Winnett, 2008,) Even with the many years that have passed since the 1970's only number one and number two have exchanged places as the leading causes of fires in America.

Conclusively, the literature review of the most prominent organization for the collection of fire data, the United States Fire Administration most recent report has determined that cooking is the leading cause of fires in residential properties. Without including the unknown apportioned causes, it was determined that 32.9 percent of fires in residential properties are caused by cooking. (USFA, 2010, p. 52).

With the fact that over 4000 student or 28% of the renting population of Cedar Falls occupy on-campus housing, (University of Northern Iowa, 2010) this author found it prudent to look at the causes of fires on campus residential housing units.

(Flynn, 2009) indicates that since 1980 there has been a 34% increase in the volume of structure fires in this class of occupancy of dormitories, fraternities, sororities and barracks. Flynn does note that some of this increase could be attributed to the 5.0 version of the National Fire Incident Reporting System (NFIRS). This newer version allows more information input as to the cause of the fires such as confined cooking and rubbish fires. The report goes on to say that during the period of 2003 -2006, 75% of the fires in this class were determined to be caused by cooking. The next prevalent cause of fires at 6% was fires contained to trash or rubbish.

Finally, the third most common cause of fires in the period between 2003-2006 were intentionally set fires in dormitories, fraternities, sororities or barracks.

Since January 2000, almost 80 percent of campus-related fire fatalities have occurred in off-campus housing or apartments. (Comeau, 2007, p. 1) Research question 2 (What are other university communities doing to address fires in residential rental properties?) There are many elements that should go into a comprehensive campus fire-safety program. In the program developed for the University of Maryland, the elements described as necessary for safe student housing are: prevention, occupant awareness and training, detection and alarms and lastly suppression or PODS used as its acronym. This program goes on to explain that the first step in prevention is to control the three elements of the fire triangle; heat, fuel and oxygen. (Mowrer, 1999) If one of these elements is missing a fire cannot start.

To control the three elements of the fire triangle, the University of California, Irvine, applies a campus standard and design manual. This manual ensures that each campus building adheres to the applicable fire and life safety standards but not limited to fire department access, fire-flow requirements, exiting, fire-resistive construction, and fire suppression and alarm systems. (University of California - Irvine, 2004)

The University of North Carolina (UNC) at Chapel Hill has taken the campus fire-safety message to off-campus students. The Environment, Health and Safety Department has developed a comprehensive web page with easy-to-follow links to information dealing with alcohol and parties through the proper storage of propane and gasoline. UNC has even published an online newsletter available to students, faculty and the public. (University of North Carolina, 2010)

Social media is quickly becoming a method of communicating with the current student generation. The University of Northern Iowa is among many who have set up social media venues to communicate with their students. At UNI, currently all but three departments, services, programs and athletic functions have Facebook pages. Four areas have Twitter™ links and six provide links to YouTube. From Panther athletics to Gallagher-Bluedorn cultural events, admissions to academic advising, students and staff stay connected, entertained and informed. (University of Northern Iowa [UNI], 2010, p. 1)

All university communities researched were also found to have ordinances, laws, or codes requiring the use of alarms. Many university policies were found to have punitive consequences for those who violate, for instance, Rutgers University's Fire Safety Guidelines state:

Students will be issued a Fire Code Violation Follow-Up Form, which must be completed and returned to Residence Life verifying that the violation has been corrected. Students who commit a second offense will be placed on probation and may face further disciplinary actions as determined by an Administrative Hearing/Conference. Students who commit a third offense may be removed from their residence. (Rutgers University, 2010)

It appears that more and more cities are requiring more stringent requirements for suppression systems in residential properties. In 2008 the International Residential Code adopted the requirement of having residential fire sprinklers in all one and two family homes and town homes. This new requirement was supported by 73 % of the voting member in attendance of the meeting. Ronny J. Coleman, president of the IRC Fire Sprinkler Coalition. They know

from experience that sprinklers are the answer to the nation's fire problem. (residential fire sprinklers.com, 2008)

When developing a fire educational plan, one of the best resources can be found in one of the nation's oldest fire prevention and educational programs, Smokey Bear. For the past 60 plus years this program has been one of the most highly recognized advertising symbols of all time.

For a municipality to have a successful fire prevention and informational program the following components from the Cooperative Forest Fire Program should be implemented. First a public service advertising campaign should be initiated with the use of the media and corporate sponsors. Secondly, a campaign should be started with class room type programs and material appropriate for the age of the intended audience. Third, is the commercial licensing of a logo or mascot. Fourth, set high standards for the image and appearance of all of the program literature, logos, personnel and costumes. Finally, awards could be given in recognition of those who have excelled in the promotion of the fire prevention program. (National Wildfire Coordinating Group, chap. 8)

Legislative actions to reduce the instances of fire in residential rental units have been in place for some time. At the local level, the City of Cedar Falls has an adopted by ordinance the Minimal Rental Housing Code. The purpose of this code is to provide minimum standards to safeguard the life, limb, health, property and public welfare by regulating and controlling the use, occupancy and maintenance of all residential rental buildings and related structures within the City of Cedar Falls. Some of the requirements found within this code are: tamper-proof smoke alarms required in all rental units; a minimum of a 2A 10BC fire extinguisher in all rental units with annual inspection, every dwelling or rooming unit must have access to two independent unobstructed means of egress. (City of Cedar Falls, 2008, p. 4)

Ames, Iowa, in 2006 drafted a city ordinance that required certain building within their corporate limits to be retro fitted with automatic sprinkler systems in accordance with Section 403.2 of the 2003 International Building Code and Section 903 of the 2003 International Fire Code. The types of building now required to be equipped with automatic sprinkler systems are: existing high-rise buildings, institutions, buildings that have more than 16 or more mobility impaired residents, and finally buildings that fall in the categories of dormitories, fraternities, sororities or barracks. (City of Ames Iowa, n.d., p. 8-3)

Even more recently in Illinois, Legislation was signed by Governor Quinn in 2010 that will require sprinklers in Greek housing by 2019. This is a great step in the direction of campus fire safety since Greek housing is the second leading cause of fire fatalities on college campuses. (Campus-firewatch.com, 2010)

At the national level there is current legislation: The Campus Fire Safety Education Act of 2010. Introduced to the House of Representatives by Congressman Bill Pascrell, Jr. (NJ) and to the Senate by Senator Frank R. Lautenberg (NJ), this bill was written establishing a new \$25 million competitive grant program to initiate, expand or improve fire safety education programs at institutions of higher education. Priority would be given to programs that include educational material specifically prepared for students with disabilities. (The Center for Campus Fire Safety, 2010)

In summary, the literature review provided information that the occurrence of residential fires in the United States has not varied much in the past forty years. However, there has been a significant increase in the occurrence of fires in dormitories, fraternities, sororities, and barracks. The literature review discovered a significant gap in the information available specifically referencing fires in rental units. The majority of the literature review focused on fires in

residential properties. Cooking still remains the number one cause of fires in residential properties whether one or two family homes or in institutional dormitory-type structures. The elements needed to provide a comprehensive residential safety program are; prevention, occupant awareness, detection and suppression. Information on fire safety now can be offered on web pages and in electronic newsletters and through the use of social media outlets. These types of delivery methods could increase exposure to both on and off-campus students and residents. Finally, there are many different avenues of legislative actions that offer solutions to the issue of fires in residential properties. These legislative actions vary from local adoption of ordinances on rental standards to governor proclamations for Campus Fire Safety Month to legislative bills in Congress.

Found to be truly enlightening during this literature review was the lack of published documentation or even raw data describing the problem of fires in residential rental units.

### Procedures

The purpose of this applied research project is to determine solution and if implemented, reduction of fires in residential rental units. Initially started as a literature review in March 2010 and concluded in August 2010, this review used resources of the National Fire Academy's Learning Resource Center located in Emmitsburg, Maryland. Other sources of the review were obtained from the Cedar Falls Public Library and the interlibrary loan program. However, much of the statistical information for the Literature Review was found by using the Internet search engine provided by the Learning Resource Center of the National Fire Academy, Google™ search engine and other scholarly websites.

To answer the research question 1; what are the factors causing fires in residential rental units? A statistical analysis was conducted through Cedar Falls Fire Rescue's records management system, Firehouse Software®. This analysis would prove to be difficult since not one specific field in CFFR fire incident reporting system addressed rental units. Each fire incident address had to be manually cross referenced with CFFR's rental occupancy records to validate that the property identified was a residential rental unit. Specific data retrieved for analysis were residential structure fire numbers, causal factors of residential fires, and injury reports. Once the data was collected, the information was compared to the national information retrieved during the literature review. This comparison was used to determine if Cedar Falls was experiencing the same issues in this problem area as the rest of the nation.

To better understand what other university communities were doing to address the issue of fires in residential rental units: a simple questionnaire was developed. Twelve questions were designed with the use of the Internet tool SurveyMonkey.com™ to elicit information on community and student population size, frequency of residential fires and causal factors, prevention and education methods and programs, inspection programs, and detection and suppression system questions for rental units. All questions were multiple choice types with six of the twelve questions providing an opportunity for the respondent to add other comments. The questions were designed for chief and staff level officers to be able to answer with minimal effort in statistical research and to require a minimal time investment. It was the questionnaire's goal for each respondent to spend no more than 20 minutes to answer all 12 questions. (Appendix A)

Developing a list of other university communities was a lengthy process. With the use of internet sites such as Google™, city-data.com and the United States Census Bureau's American FactFinder, a list of 75 universities and colleges was compiled. From this list, a list of fire

departments that were responsible for providing fire suppression services to each campus was produced. E-mail addresses for the chief officers were copied into the distribution list. The site SurveyMonkey.com™ provided an abbreviated hyperlink to the questionnaire. This hyperlink was copied and pasted into an e-mail and sent to the authors municipal e-mail address.

(Appendix B)

To allow anonymity of the respondents, the original e-mail was also sent to the authors municipal e-mail address and the distribution list of university community fire departments was entered as blind copies. To further maintain the privacy of the respondents, it was decided not to use the collection method offered by SurveyMonkey.com™ that would have allowed tracking of who completed the questionnaire by their IP address.

As this information would be relevant to all of the fire departments receiving the questionnaire, the original e-mail offered the results of the questionnaire. Each respondent simply needed to reply to the original e-mail with their name, department and e-mail address.

Finally for research question 2, the results of the questionnaire were collected and used in the Results, Discussion and Recommendations portion of this applied research project. These results will also be valuable if CFFR builds a residential-rental-unit fire-risk reduction program.

Research question 3 entailed discovering what educational and informational components could be implemented to reduce the problem of fires in residential rental units. Discovery of this information was possible by viewing the websites of multiple fire departments and universities. Also a key discovery was the statistical information derived from the questionnaire and placed in the results section of this project.

Much in the same as the procedure for research question 3, research question 4 followed the same procedure. Searches of various fire department and university websites also discovered

to two websites wholly dedicated to college campus safety. The first was Campus-firewatch.com and the second was the Center for Campus Fire Safety, (CCFS) campusfiresafety.org. These two websites provided valuable information on national statistics with direct correlation to the issues of fires on college campuses. This information was crucial for determining the legislative alternatives in the Recommendation section of this applied research project.

### Limitations

Several limitations were discovered about stored data bases for this project. First, any data used in the analysis of causal factors of fires in residential properties could only be viewed as accurate as the individual entering the information. Second, Cedar Falls Fire Rescue's records management system only dates back to 2001, with only 9.5 years of searchable digital data available. Third, relatively no information was found with specific reference to fires in residential rental units either on or off-campus. Fourth, an assumption was made that when researched information made reference to on and off campus housing that vast majority of these properties were off-campus rental units. Finally, since the author has limited experience in developing a validated survey, a simple questionnaire was developed to aid in answering the research questions.

### Definitions

**On-Campus Housing:** Residence halls or any building under the control of the institution housing students. This could include the typical dormitory-style residence hall, married-student housing, graduate-student housing, etc. This classification also includes any third-party residence

halls (that are becoming more prevalent on campuses) or houses that are purchased by the school and used as student residences. (Comeau, 2007, ¶ 11)

Off-Campus Housing: Any house or apartment not under the control of the institution. Generally, this tends to be either an apartment building or a one- or two-family house that is occupied by one or more students. (Comeau, 2007, ¶ 10)

Greek Housing - Greek housing is any building occupied by a recognized fraternity or sorority. The ownership on these buildings can vary significantly. In some cases, the building is owned by the national Greek organization: In other cases, it might be rented from a local landlord or owned by a local fraternity organization known as the corporation board, or "corp board." (Comeau, 2007, ¶ 12)

## Results

The results of this applied research project are derived from the literature review, statistical analysis of Cedar Falls Fire Rescue's record management system and the questionnaire developed on SurveyMonkey.com™ that was sent to seventy-five community fire departments that protect colleges and/or universities. An unexpected result of the literature review was the lack of information available from credible sources in reference to fires in residential rental units. That shifted the project focus research to more a generic owner-occupied residential structure class and those structures classified as dormitories, fraternities, sororities and barracks.

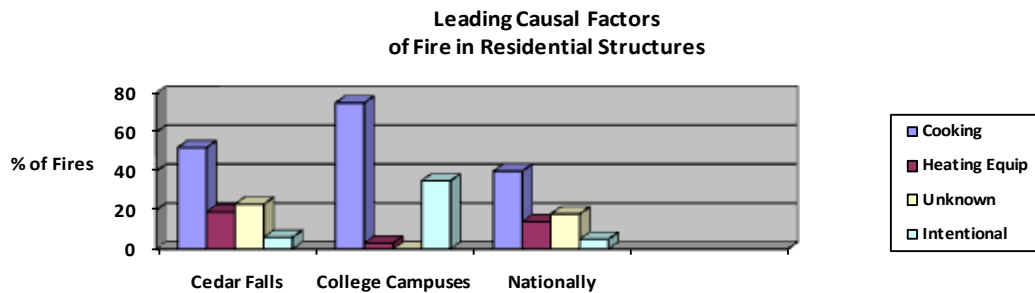
The results of the questionnaire were used to help determine what other fire departments are doing to address the problem statement of this project. A full statistical analysis of this

questionnaire can be found in Appendix C and a descriptive summation of the questionnaire results can be found in Appendix D. To summarize the questionnaire, the method used developed questions in five areas to help better understand the respondents and their endeavors towards reducing the risk of residential fires. There was a 30% return for the 75 questionnaires that were e-mailed.

Research Question 1. What are the factors causing fires in residential rental units?

When analyzing the data of CFFR's record management system, it proved difficult to determine whether the structure in question was a residential rental unit or owner occupied. A step was added to determine the occupancy class by cross referencing the address with the addresses found in the CFFR's occupancy records. The results of this data analysis found that the City of Cedar Falls values on causal factors for residential structure fires are very close to the statistics determined by the United States Fire Administration. Cooking fires are at the top of the list with 52% for the City of Cedar Falls and 40% for the nation. Unknown causes of fire were determined to be the second most frequent with the City of Cedar Falls reporting 23% versus 18% nationally. The third highest it was heating equipment accounting for 19% in Cedar Falls versus 14% for the other reporting cities in America. Conversely, the statistics reported for college campuses were quite different comparing Cedar Falls to the rest of the nation. With the exception of cooking remaining the leading cause at 75% of fires nationwide on college campuses, intentionally set fires came in second at 35% and heating equipment in third at 30%.

Table 1



Note: Statistical information derived from the following sources  
(Flynn, 2009), (USFA, 2010), Cedar Falls Fire Rescue records management system.

Within the questionnaire that was sent to 75 fire departments, question 4 and 5 asked frequency and causal factors of fires in the respondent's communities. Question 4 specifically asked: On an annual basis, what percent of residential fires in your service area occur in residential rental units? The highest percentage answered was 21 – 40 percent. Comparatively CFFR instances of residential rental unit fires are 58%. It was interesting to see these results come forward with relative ease for the respondents, but yet during the literature review almost no published or raw data could be discovered to assist in this area. Question 5 specifically asked: Please place in order the most frequent causes of ignition for residential fires in you service area with the number one being the most frequent cause of ignition. The answers provided to this question were not surprising with cooking as the number one cause of fires in residential rental properties. This statistic coincides with both the City of Cedar Falls and the rest of the nation. The second most prevalent cause of fires as determined by this questionnaire

was candles. This result was unexpected as candles were not even mentioned in any of the information in the literature review.

Research Question 2. What are other university communities doing to address fires in residential rental properties? Four sets of questions in the e-mailed questionnaire were used to determine the answers for Research Question 2. Demographic information was needed to determine comparative data for future use. The first set of questions in the questionnaire numbered one through three addressed demographic information. Question 1: What is the population that your department serves? The top response for a population base was comparable to the City of Cedar Falls at 25,001 to 50,000 residents. Question 2 asked: What is the approximate number of students enrolled in the colleges or universities within your service area? Twenty thousand plus students had the highest response at 36.4%. This was higher than the University of Northern Iowa which has 13,000 students. Question 3 was used to determine how many students lived off campus in their respective communities. Fifty percent answered that 40 to 60 percent of their student population lived off campus. This result is very close to UNI's 68% living off campus

The second set of questions was asked to elicit a response to questions about fire prevention and education methods and programs. Question 6: Which of the following fire prevention/education methods does your department provide? The respondents were also asked to choose all answers that applied to their department's prevention and education methods. The leading results for this question were 75% provided fire prevention/education at college/university student orientations. Sixty-eight percent stated that they provide resident assistant (RA) Fire safety/education training. Question 7: Has your department developed a

program to address residential rental unit fires for properties both on and off campus? The choices of answers were simply yes or no. Eighty-five percent said “no” while 15% said “Yes”. It should be noted that Cedar Falls Fire Rescue only has a program to aid resident assistants, faculty and staff in fire safety and fire extinguisher use.

The third set involved questions about their department’s inspections program as they relate to residential rental housing. Question 8: How often are residential rental units within your service area inspected? Clearly the majority, 57.9%, inspected rental units on an annual basis. While the City of Cedar Falls rental units are inspected once every three years. The state minimum in Iowa is no less often than every five years. Question 9: Are certificates of occupancy issued for residential rental units within your service area? Again, this question simply asked for a yes or no. Seventy-three percent answered “yes” and 27% answering “no.” This question established if the department could revoke an occupancy certificate if the landlord or tenant did not comply with the established rental code. The final question in this set was question 10: If you answered “yes” to Question 9, please indicate who issues the occupancy certificates. Only those who answered yes to question 9 should have answered this question. Ninety-three percent of those who answered this question stated that their Code Enforcement Department issued these certificates. Only one respondent answered “yes” to fire-department-issued occupancy permits. In Cedar Falls, CFFR issues certificates of occupancy. It should be noted that nine of the respondents skipped this question.

The fourth set of questions was designed to determine what type of fire detection and suppression systems were required for both on and off-campus residential rentals. Question 11: What types of fire detection and/or suppression systems are required in the “ON” campus residential housing properties within your service area? Please check all that apply. Not

surprisingly, smoke detectors had the highest percentage of requirement at 95%. What was surprising was that seventy-five percent stated that automatic sprinkler systems were required. Question 12: What type of fire detection and/or suppression systems are required in the “OFF” campus residential housing properties within your service area? Please check all that apply. Smoke alarms ranked the number one answer at 100%, fire extinguishers came in a distant second at 60% and in third place was the requirement for automatic fire sprinklers at 35%.

Overall the SurveyMonkey.com™ questionnaire was considered successful. Much of the information derived from this questionnaire will be used in the recommendation section of this report and for future use if a risk reduction plan is developed.

Research Question 3. What educational and informational components can be implemented to reduce the problem of fires in residential rental properties?

The literature review proved invaluable for this question resulting with the following findings. Web media and social networking are the way of the future. Many university websites visited during the research phase of this report offered components of fire prevention educational programs and newsletters geared toward fire safety. Publishing rental codes and standards for off campus housing or university policy on fire safety is another way of disseminating the fire-prevention message. Another valuable tool used are Twitter and Facebook pages allowing students and tenants to follow emerging issues of fire safety.

It was noted in the questionnaire that few fire departments offer fire education or informational components to students who are transitioning from on-campus housing to off-campus housing.

Research Question 4. What legislative solutions can be enacted to reduce the fire problem in rental units?

The literature review provided the results for this particular question. There are currently several bills in the 2010 session of the U.S. Congress. A few of these bills could directly benefit both the City of Cedar Falls and the University of Northern Iowa. For instance the Campus Fire Safety Education Act of 2010 (H.R. 4908) could provide \$25 million to colleges and universities across the country in competitive grant money to assist with campus fire-education programs. At the state level we are waiting for the signature proclaiming September as Campus Fire Safety Month in Iowa. At the local level, the literature review phase of this project offered new insight into improving the minimal rental housing code of Cedar Falls, Iowa, by requiring more smoke detectors per rental unit or increasing the requirement for automatic fire-sprinkler systems.

### Discussion

When residential structure fires in the United States out number other structure fires three to one, (USFA, 2010, p. 4), and when 58% of structure fires in Cedar Falls, Iowa, occur in residential rental units, it time for Cedar Falls Fire Rescue to take action. In supporting the United States Fire Administrations operation objective of reducing risk at the local level (United States Fire Administration, 2009, p. II-2), this research and subsequent results have provided an opportunity for CFFR to make recommendations for methods and programs for reduce residential rental unit fires.

As the author of this report I was quite pleased to see while conducting the research into this problem that the residential fire statistics for the City of Cedar Falls were similar to that of the rest of the country. For instance, cooking fires top the list of causal factors for residential

structure fires for both Cedar Falls and the United States. Also, the second most prevalent cause of fires in Cedar Falls as well as the rest of the nation were classified as heating equipment.

(USFA, 2010)

The results of the questionnaire proved to be very enlightening and reinforced the fact that Cedar Falls Fire Rescue is severely lacking in public education programs. Education prevention methods and programs are going to be paramount in in CFFR's effort to reduce the risk of fires in residential rental units. As the frequency of fires decrease each year in the United States, down 40 percent over the past 20 years, fires in college residence hall dormitories and Greek houses remain stubbornly steady between 1,500 and 1,800 each year. Although most fires are small, each has the potential for tragedy. (Carter and Burgess, 2006, p. 8) The mission of the fire departments across the United States will evolve from that of a mitigation force to that of risk managers. Once a risk has been identified, it should be the goal of the fire service to address the risk through preventative education methods and programs. The literature review and questionnaire definitely reinforced the need of fire departments to become more active risk managers.

The results of this project on Cedar Falls Fire Rescue will be the beginning of a new methodology for how we are to accomplish our mission. One of CFFR's philosophical standards is; "Prevention – Reduce the risk to life and property that may be caused by fire and other potential threats" now needs to be in the forefront for all firefighters to accept and carry out.

Improving the risk reduction methods for the City of Cedar Falls will come with a cost. Careful planning and program development will need to be a priority. CFFR currently operates with limited administrative staff. Much of the responsibility for the development will fall on administration and the actual delivery could become another functional area for the line officers

and firefighters. Along with the risk reduction program development, a time/staff accountability study might have to be developed to determine required staffing commitment. In a city which has adopted the LEAN government methodology, additional staffing requirements may prove to be difficult to come by.

As the author of this applied research project, I feel that that a significant risk to life and property has been identified, methods and programs have been discovered through research and statistics have been formulated to provide a basis for the development, funding and implementation of a comprehensive risk-reduction program. Such a program could reduce the frequency of fires in residential rental units for both the City Cedar Falls, Iowa, and the University of Northern Iowa. Such a program could save lives. The mantra of Cedar Falls Fire Rescue must nope become “educate, mitigate and evaluate.

### Recommendations

Based on the results of this research, there is enough conclusive information that demonstrates the need for Cedar Falls Fire Rescue to proceed with developing an community risk-reduction program to address the issue of fires in residential rental units. Further research will be necessary to address all of the needs for this new program.

An internal presentation must be given to senior city management and then, if supported, a presentation to the city council to garner the necessary support to take the proposal to the community. The presentation should include a time/staff management study to show the projected cost of such a program. The designation of alternate funding sources would be beneficial to this group’s presentation. Next, presentations should be made to all of the groups that would benefit from this program. The presentation should show the data from this research

project and what other similar-sized communities are doing to address the same issues in their own community. Once the presentations have been delivered, Cedar Falls Fire Rescue should spearhead a team of community stakeholders to lead the way in building the outline for a plan to reduce fires in rental units. A coalition should be formed that is comprised of community partners from the CFFR, UNI administration, UNI student's, Cedar Falls Public School District, Cedar Falls Landlord Association, a representative of the Iowa State Fire Marshal's office and one or two citizens-at-large. A representative from the State Fire Marshal's office is necessary as they are the authority having jurisdiction for the university property. This team should also be unbiased toward gender, race or ethnicity. Once the team is formed, members will set the direction and develop subcommittees to address the need of the comprehensive plan that could include the following categories:

#### Prevention

Reviews are needed to ensure that the intent of the current Cedar Falls Minimal Rental Housing Code (Chapter 14) is still being met and the code is at the current national standard. To ensure that applicable codes for future include fire detection suppression and life-safety standards and how a review of the current rental inspection process for off-campus housing should be conducted. Particular attention should be given to the frequency of inspection to ensure that the fire and life safety needs are being maintained between the inspection dates..

#### Occupant Awareness and Training

This is an area where the City of Cedar Falls lags behind other university communities. It is recommended that a program be developed with the assistance of UNI faculty to address fire

safety for incoming students. This should be for both on and off-campus students. During student orientation, there is a captive audience and there could be a short presentation on fire safety.

Other training opportunities exist when a student transitions from on campus to off campus housing. At a minimum an information brochure should be developed and included the packet for the student who moves into a new living arrangement.

With today's technologically savvy student population, the use of electronic media is a necessity. It is recommended that all of the coalition members incorporate fire-safety pages on their websites. This is an economical means of communicating good information to those who are otherwise unreachable.

Social media is yet another avenue of communication for our student and renter populations. It is recommended that again all stakeholders incorporate the use of social media outlets such as Twitter, Facebook, YouTube and LinkedIn. With the use of these services, stakeholders can reach the students or tenants with educational information almost anywhere.

Additional attention should be given to those tenants of rental properties who do not have ties to the UNI. Through the assistance of the landlord associations, a brochure or wall posting should be developed with specific residential fire-safety tips. This brochure should be required to be framed and placed on the wall or on the back of the main rental unit door next to the occupancy permit. This can be similar to those postings found on the back of hotel doors.

### Detection and Suppression

It is recommended that there be further research into the issue of mandated residential automatic sprinkler systems. Currently there is not enough information available to make a

recommendation. A recommendation to CFFR's administrative staff would be to monitor the issue of residential fire sprinklers and evaluate the process at the state and local levels for future implementation.

### Legislative

It is recommended that CFFR staff and coalition members become active in legislation that would enhance the risk reduction program. Avenues that partners could pursue would include contact with their national and state legislators when fire-safety and campus-safety legislation is up for discussion and/or votes, monitoring grant opportunities for public fire prevention and education, and supporting local ordinances that involve key issues.

As taught in the Executive Analysis of Community Risk Reduction if a risk is identified, the risk must be reduced. In Cedar Falls Iowa, the risk to the tenants of residential rental units has been identified with this project that addresses the risk to rental tenants. .

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Appendix A

**Reducing Residential Rental Unit Fires Questionnaire**

**1. What is the population that your department serves?**

**Answer Options**

- ☐ 0-25000
- ☐ 25001-50000
- ☐ 50001-75000
- ☐ 75001-100000
- ☐ 100000+

**2. What is the approximate number of students enrolled in the colleges or universities within your service area?**

**Answer Options**

- ☐ 0-5000
- ☐ 5001-10000
- ☐ 10001-15000
- ☐ 15001-20000
- ☐ 20000+

**3. Approximately how many students live off campus?**

**Answer Options**

- ☐ 0-30%
- ☐ 40%-60%
- ☐ 61%-80%
- ☐ 80%+
- ☐ Unknown

**4. On an annual basis, what percent of residential fires in your service area occur in residential rental units?**

**Answer Options**

- ☐ 0-20%
- ☐ 21%-40%
- ☐ 41%-60%
- ☐ 61%-80%
- ☐ 80%+
- ☐ Unknown

**5. Please place in order the most frequent causes of ignition for residential fires in you service area with 1 being the most frequent cause of ignition**

<b>Answer Options</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Cooking Fires					
Smoking					
Candles					
Electrical					
Heating equipment					
Unknown					
Other (please specify)					

**6. Which of the following fire prevention/education methods does your department provide? Please check all that apply**

**Answer Options**

- ☐ High school fire prevention education
- ☐ Fire prevention/education at college/university student orientations
- ☐ Provide fire prevention/education continually throughout the school year for college/university students
- ☐ Resident Assistant (RA) Fire safety/education training
- ☐ Fire safety education training for campus safety personnel
- ☐ Fire prevention/safety training for students transitioning from on campus to off campus
- ☐ Other (please specify)

**7. Has your department developed a program to address residential rental unit fires for properties both on and off campus?**

**Answer Options**

- ☐ Yes
- ☐ No

**8. How often are residential rental units within your service area inspected?**

**Answer Options**

- ☐ Annually
- ☐ 2 years
- ☐ 3 years
- ☐ 4+ years
- ☐ They are not inspected
- ☐ Other (please specify)

**9. Are certificates of occupancy issued for residential rental units within your service area?**

**Answer Options**

- ☐ Yes
- ☐ No

**10. If you answered yes to question #9, please indicate who issues the occupancy certificates.**

**Answer Options**

- ☐ Fire Department
- ☐ Police Department
- ☐ Code Enforcement Department
- ☐ Other (please specify)

**11. What type of fire detection and/or suppression systems are required in the ON campus residential housing properties within your service area? Please check all that apply**

**Answer Options**

- ☐ Heat
- ☐ Smoke
- ☐ Fire Extinguishers
- ☐ Standpipe/Hose Cabinets
- ☐ Automatic Fire Sprinklers
- ☐ None
- ☐ Other (please specify)

**12. What type of fire detection and/or suppression systems are required in the OFF campus residential housing properties within your service area? Please check all that apply**

**Answer Options**

- ☐ Heat
- ☐ Smoke
- ☐ Fire Extinguishers
- ☐ Standpipe/hose cabinet
- ☐ Automatic Fire Sprinklers
- ☐ None
- ☐ Other (please specify)

## Appendix B

Original e-mail sent to 75 fire departments which provide fire suppression services to on and off campus college/university housing. All recipients were blind copied to preserve their anonymity

**John Schilling**

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**From:** John Schilling  
**Sent:** Wednesday, August 11, 2010 4:30 PM  
**To:** John Schilling  
**Subject:** Request for help with Executive Fire Officer ARP Survey

Good day,

Allow me to introduce myself. My Name is John-Paul Schilling; I am the Fire Chief for the City of Cedar Falls Iowa. Cedar Falls is located in Northeast Iowa and is home to the University of Northern Iowa.

I am currently enrolled in the National Fire Academy's Executive Fire Officer Program. I am conducting research on the issue of fires in residential rental units. Currently 58% of the structure fires in Cedar Falls occur in residential rental property. These residential rental properties only amount of 18% of the entire building stock of the city.

The members of this distribution list are chief officers in communities with colleges or universities. It is my goals to collect the data, analyze it and produce a risk reduction program for the City of Cedar Falls. I understand that you may not be the right person to answer these questions, if not please forward this to the appropriate person within your organization.

Should you want the raw data retrieved from this questionnaire, I am willing to send it to you via e-mail in a simple excel document. Please reply to this e-mail with the following information.

Name

Department

E-mail address

Your timely assistance in completing this short 12 question form and assisting in providing a more fire safe United States is greatly appreciated. Please click on the link below and you will be taken immediately to the questionnaire

<http://www.surveymonkey.com/s/MJTL39F>

In the interest of public safety

John-Paul Schilling  
 Fire Chief  
 Cedar Falls Fire Rescue  
 Cedar Falls, Iowa  
 Office 319.273.8690  
 Fax 319.273.8663

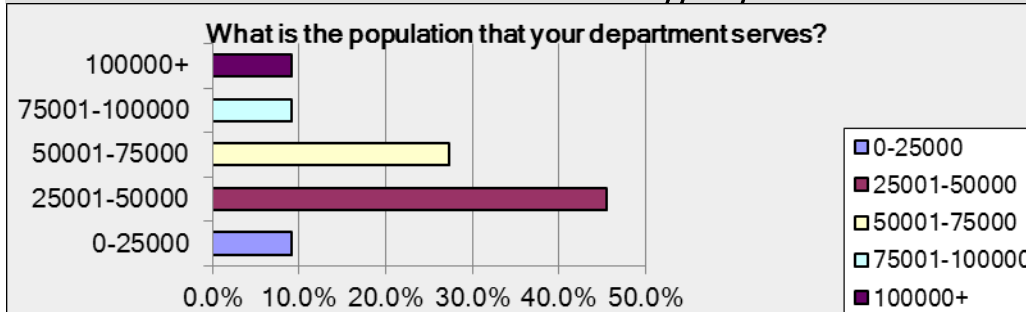
Educate Mitigate Evaluate

## Appendix C

## Descriptive Analysis of Questionnaire

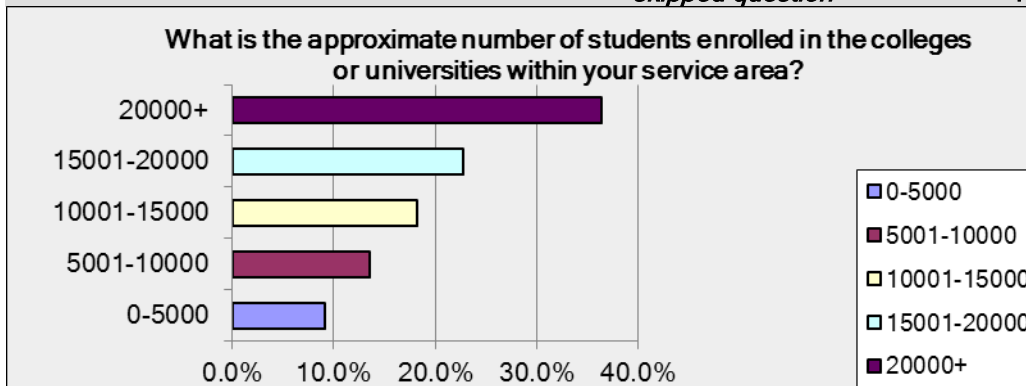
## 1. What is the population that your department serves?

Answer Options	Response Percent	Response Count
0-25000	9.1%	2
25001-50000	45.5%	10
50001-75000	27.3%	6
75001-100000	9.1%	2
100000+	9.1%	2
<i>answered question</i>		<b>22</b>
<i>skipped question</i>		<b>1</b>



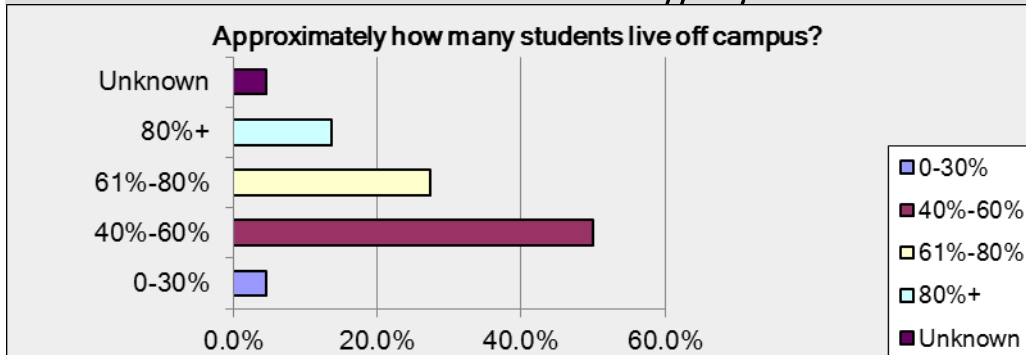
## 2. What is the approximate number of students enrolled in the colleges or universities within your service area?

Answer Options	Response Percent	Response Count
0-5000	9.1%	2
5001-10000	13.6%	3
10001-15000	18.2%	4
15001-20000	22.7%	5
20000+	36.4%	8
<i>answered question</i>		<b>22</b>
<i>skipped question</i>		<b>1</b>



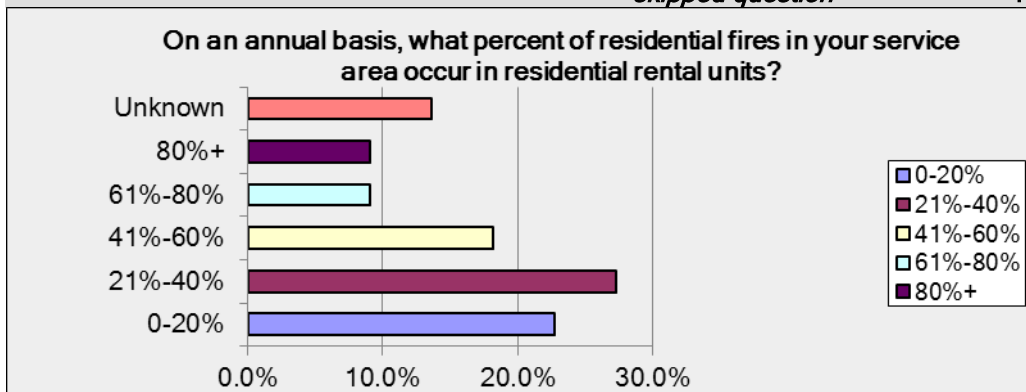
### 3. Approximately how many students live off campus?

Answer Options	Response Percent	Response Count
0-30%	4.5%	1
40%-60%	50.0%	11
61%-80%	27.3%	6
80%+	13.6%	3
Unknown	4.5%	1
<b>answered question</b>		<b>22</b>
<b>skipped question</b>		<b>1</b>



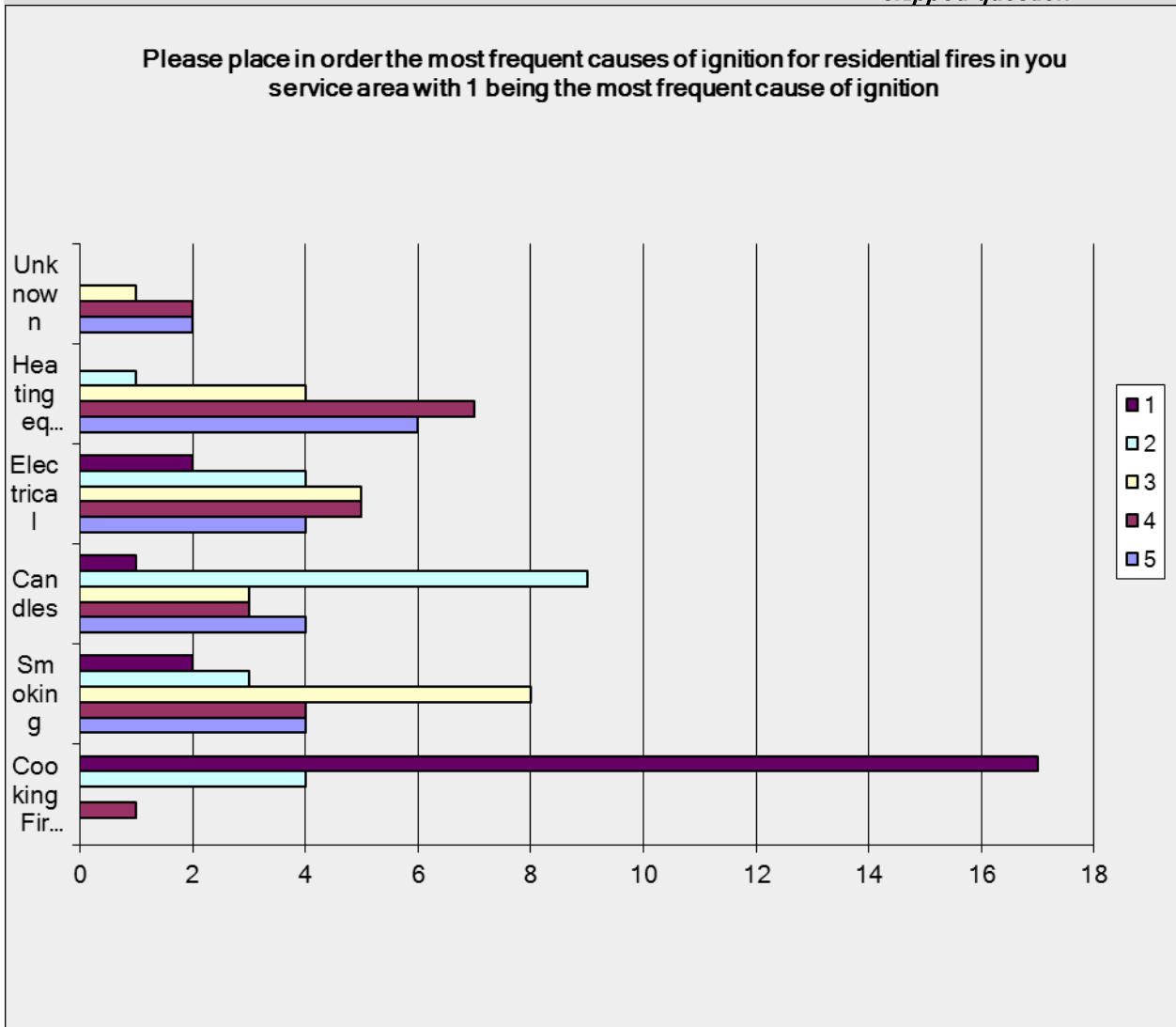
### 4. On an annual basis, what percent of residential fires in your service area occur in residential rental units?

Answer Options	Response Percent	Response Count
0-20%	22.7%	5
21%-40%	27.3%	6
41%-60%	18.2%	4
61%-80%	9.1%	2
80%+	9.1%	2
Unknown	13.6%	3
<b>answered question</b>		<b>22</b>
<b>skipped question</b>		<b>1</b>



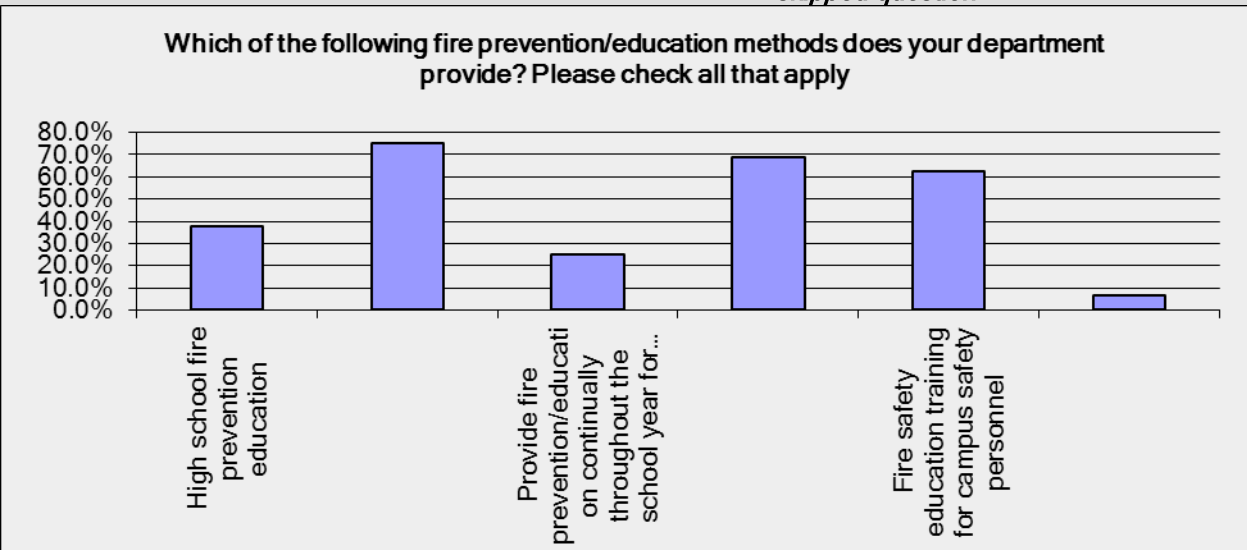
5. Please place in order the most frequent causes of ignition for residential fires in you service area with 1 being the most frequent cause of ignition

Answer Options	1	2	3	4	5	Response Count
Cooking Fires	17	4	0	1	0	22
Smoking	2	3	8	4	4	21
Candles	1	9	3	3	4	20
Electrical	2	4	5	5	4	20
Heating equipment	0	1	4	7	6	18
Unknown	0	0	1	2	2	5
Other (please specify)						1
<i>answered question</i>						22
<i>skipped question</i>						1



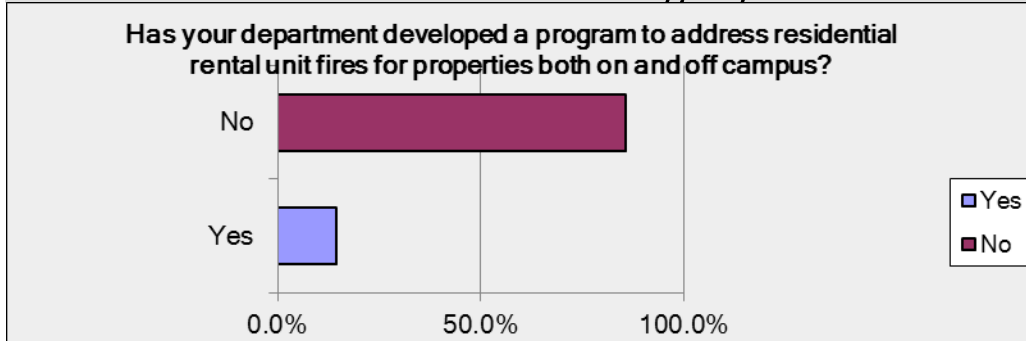
**6. Which of the following fire prevention/education methods does your department provide? Please check all that apply**

Answer Options	Response Percent	Response Count
High school fire prevention education	37.5%	6
Fire prevention/education at college/university student orientations	75.0%	12
Provide fire prevention/education continually throughout the school year for college/university students	25.0%	4
Resident Assistant (RA) Fire safety/education training	68.8%	11
Fire safety education training for campus safety personnel	62.5%	10
Fire prevention/safety training for students transitioning from on campus to off campus	6.3%	1
Other (please specify)		7
<i>answered question</i>		<b>16</b>
<i>skipped question</i>		<b>7</b>



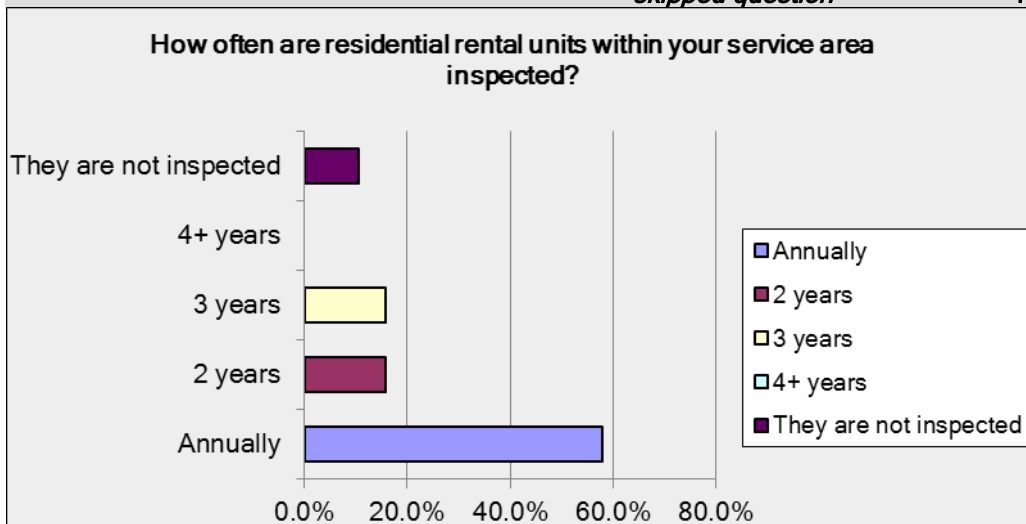
**7. Has your department developed a program to address residential rental unit fires for properties both on and off campus?**

Answer Options	Response Percent	Response Count
Yes	14.3%	3
No	85.7%	18
<i>answered question</i>		<b>21</b>
<i>skipped question</i>		<b>2</b>



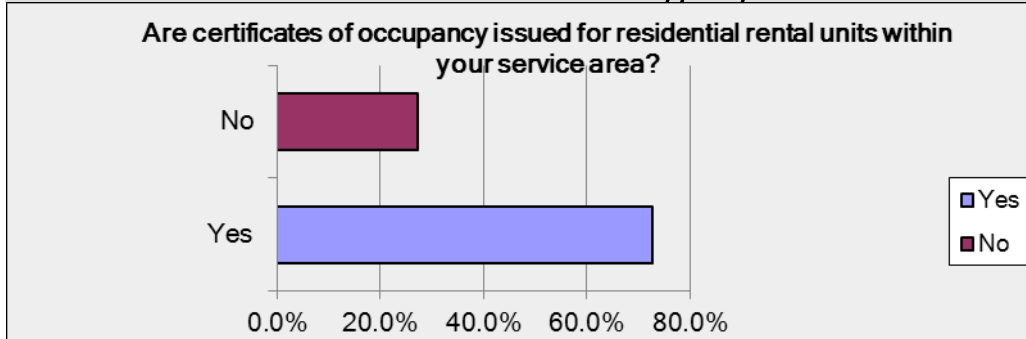
**8. How often are residential rental units within your service area inspected?**

Answer Options	Response Percent	Response Count
Annually	57.9%	11
2 years	15.8%	3
3 years	15.8%	3
4+ years	0.0%	0
They are not inspected	10.5%	2
Other (please specify)		8
<i>answered question</i>		<b>19</b>
<i>skipped question</i>		<b>4</b>



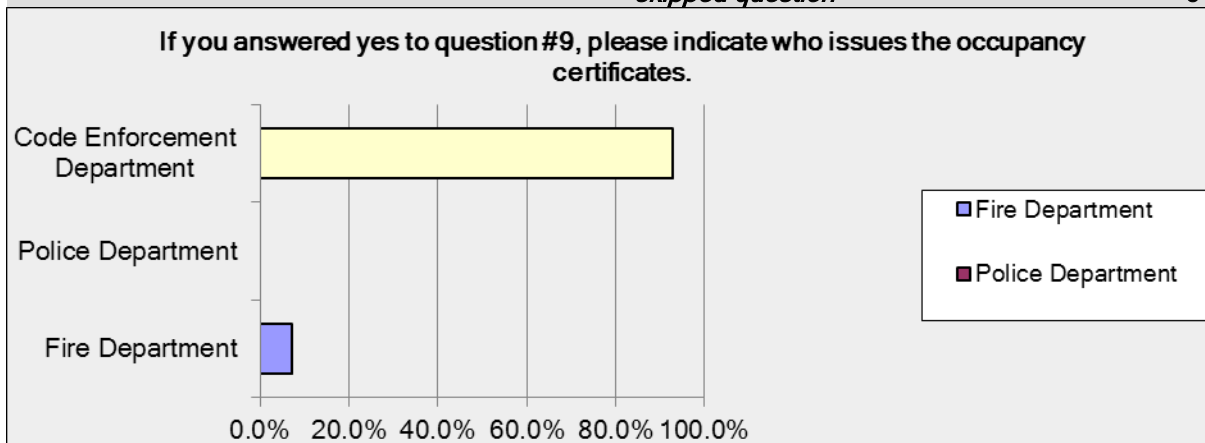
**9. Are certificates of occupancy issued for residential rental units within your service area?**

Answer Options	Response Percent	Response Count
Yes	72.7%	16
No	27.3%	6
<i>answered question</i>		<b>22</b>
<i>skipped question</i>		<b>1</b>



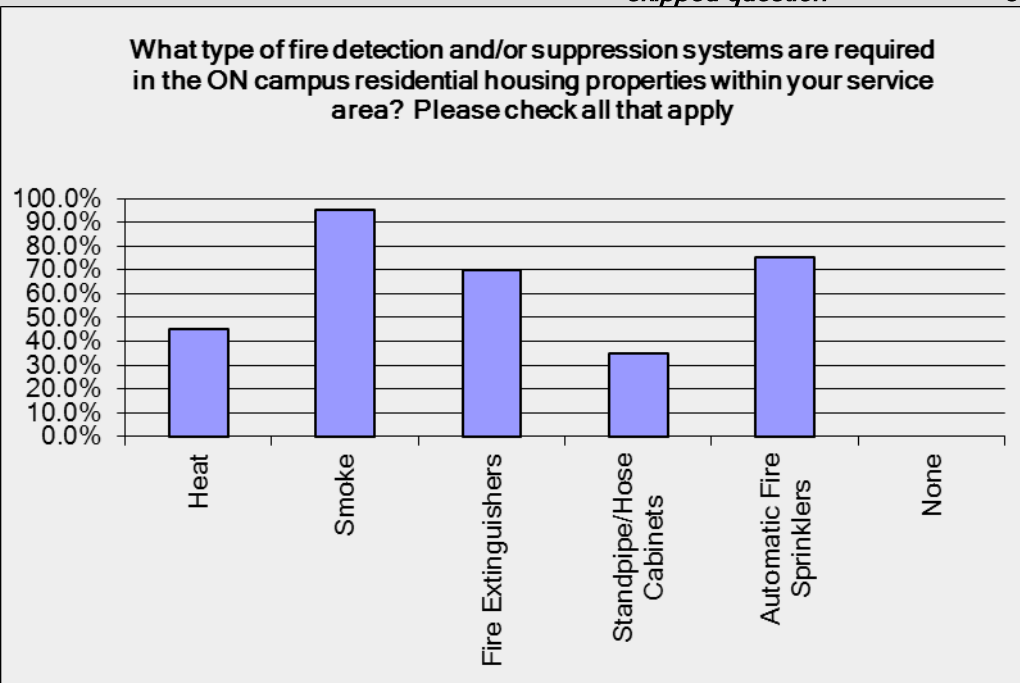
**10. If you answered yes to question #9, please indicate who issues the occupancy certificates.**

Answer Options	Response Percent	Response Count
Fire Department	7.1%	1
Police Department	0.0%	0
Code Enforcement Department	92.9%	13
Other (please specify)		5
<i>answered question</i>		<b>14</b>
<i>skipped question</i>		<b>9</b>



**11. What type of fire detection and/or suppression systems are required in the ON campus residential housing properties within your service area? Please check all that apply**

Answer Options	Response Percent	Response Count
Heat	45.0%	9
Smoke	95.0%	19
Fire Extinguishers	70.0%	14
Standpipe/Hose Cabinets	35.0%	7
Automatic Fire Sprinklers	75.0%	15
None	0.0%	0
Other (please specify)		8
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>3</b>



12. What type of fire detection and/or suppression systems are required in the OFF campus residential housing properties within your service area? Please check all that apply

Answer Options	Response Percent	Response Count
Heat	15.0%	3
Smoke	100.0%	20
Fire Extinguishers	60.0%	12
Standpipe/hose cabinet	25.0%	5
Automatic Fire Sprinklers	35.0%	7
None	0.0%	0
Other (please specify)		10
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>3</b>

